Abstract

Fuel cells 100 of the invention are operable at a temperature of about 500°C. The unit cell has a solid oxide electrolyte layer formed on a hydrogen separable metal layer. An anode has a catalyst supported thereon to accelerate a reforming reaction of methane. A fuel gas is produced by reforming a hydrocarbon-containing material in a reformer 20. Setting a lower reaction temperature enables production of the fuel gas containing both methane and hydrogen. In the fuel cells 100 receiving a supply of the fuel gas, the reforming reaction of methane contained in the fuel gas proceeds simultaneously with consumption of hydrogen contained in the fuel gas. This methane reforming reaction is endothermic to absorb heat produced in the process of power generation and thereby equalizes the operation temperature of the fuel cells 100.